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Kenneth E. Dahlberg

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Exxon Mobil Upstream
Research Company
P.O. Box 2189
(CORP-URC-SW 359)
Houston, TX 77252-2189

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Please find below and/or attached an Office communication concerning this application or proceeding.

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1 UNITED STATES PATENT AND TRADEMARK OFFICE

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4 BEFORE THE BOARD OF PATENT APPEALS
5 AND INTERFERENCES
6

7
8 *Ex parte* KENNETH E. DAHLBERG
9

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11 Appeal 2007-3506
12 Application 10/042,475¹
13 Technology Center 2100
14

15
16 Decided: October 31, 2008
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18

19
20 Before ALLEN R. MACDONALD, *Vice Chief Administrative Patent Judge*,
21 LINDA E. HORNER, and CAROLYN D. THOMAS, *Administrative Patent*
22 *Judges*.

23
24 THOMAS, *Administrative Patent Judge*.

25
26 DECISION ON APPEAL
27

28 I. STATEMENT OF THE CASE

29 Appellant appeals under 35 U.S.C. § 134 from a final rejection
30 of claims 1-12 mailed January 18, 2006. We have jurisdiction under
31 35 U.S.C. § 6(b) (2002).
32

¹ Application filed January 9, 2002. The real party in interest is ExxonMobil Upstream Research Company.

1 A. SUMMARY OF DECISION

2 We REVERSE the rejections under 35 U.S.C. §§ 102(a)/103(a).
3 However, we also use our authority under 37 C.F.R. § 41.50(b) to
4 enter two new grounds of rejections: (1) claims 1-12 under 35 U.S.C. § 112,
5 second paragraph, and (2) claims 1-12 under 35 U.S.C. § 112, first
6 paragraph.

7
8 B. INVENTION

9 Appellant invented a method for analyzing well log data obtained in
10 thinly-bedded reservoirs to obtain estimates of hydrocarbon pore volume.
11 The analysis is applied on the basis that the reservoir formation is
12 constituted by a sequence of approximately parallel, planar beds that are
13 classified into bed types and wherein each bed type can be characterized as
14 to porosity, capillary pressure behavior (i.e., water saturation), and aspect
15 ratio. (Spec. 3: para. [0008].)

16
17 C. ILLUSTRATIVE CLAIM

18 The appeal contains claims 1-12. Illustrative claim 1 is the only
19 independent claim:

20 1. A method of analyzing data obtained from well logs
21 taken in a subsurface geological formation having thinly interbedded
22 sandstone and shale layers to determine an expected value of the
23 hydrocarbon pore volume of the formation, comprising:

24 (a) defining an initial model of the subsurface
25 formation based upon estimates of different bed types and bed-type
26 parameters in the formation, one of said bed-type parameters being
27 aspect ratio, the initial model including a system of log equations for
28 predicting well logs from bed-type parameters;

(b) performing a Monte Carlo inversion to find the ranges of bed-type parameters consistent with the measured well log data; and

(c) determining a statistical distribution for hydrocarbon pore volume representing the expected value for and an uncertainty in the hydrocarbon pore volume from said Monte Carlo inversion.

D. REFERENCES

The references relied upon by the Examiner in rejecting the claims on appeal are as follows:

Tabanou	US 5,461,562	Oct. 24, 1995
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Malinverno	WO 00/48022	Aug. 17, 2000
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E. REJECTIONS ON APPEAL

The Examiner entered the following two (2) rejections which are before us for review:

Claims 1-6, 8, and 10-12 are rejected under 35 U.S.C. § 102(a) as being anticipated by Malinverno²; and

Claims 7 and 9 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Malinverno in view of Tabanou.

² Claim 8 depends from claim 7 which is rejected under § 103. Thus, claim 8 shall be treated as also being rejected under § 103. Similarly, claims 10-12, which depend from claim 9, shall also be treated as being rejected under § 103.

II. ISSUE

(1) Whether the claimed invention requires that one of the bed-type parameters be an aspect ratio, and if so, whether Appellant has shown that the Examiner erred in rejecting claim 1 as being anticipated by Malinverno?

III. FINDINGS OF FACT

The following findings of fact (FF) are supported by a preponderance of the evidence.

Invention

1. The Specification discloses that “the aspect ratio is defined as the ratio of bed thickness to bed width . . .” (7:para. [0028]).

2. Claim 1 recites a step of “(c) determining” that does not recite any structure or acts for performing the function recited in that step, and thereby encompasses all possible ways of accomplishing the claimed step. (claim 1.)

3. The Specification does not identify any corresponding structure or acts for performing the claimed determining step, but instead, describes only the desired result recited in the claimed determining step. (12: para. [0037]).

Malinverno

4. Malinverno discloses that “[b]y ‘reservoir model’ we mean a quantitative parameterized representation of the subsurface in terms of geometries and material properties. . . . The material model parameters will typically identify properties of distributed subsurface materials, such as seismic wave velocities, porosities, permeabilities, fluid saturations, densities, fluid pressures, or temperatures.” (2:¶1.)

5. Malinverno discloses that “[m]any reservoir simulations rely heavily on production data from wells and only four types of geological or geophysical reservoir information: structure of the top of the reservoir, reservoir thickness, porosity, and the ratio of net pay to gross pay.” (5:¶2.)

6. Malinverno discloses that “[t]his model has seven parameters: the thicknesses h_i of the two top layers at two locations define the SEM geometry, and three compressional wave velocities v_{Pi} are material properties.” (12:¶1.)

IV. PRINCIPLES OF LAW

Relating to Anticipation/Obviousness

"Both anticipation under § 102 and obviousness under § 103 are two-step inquiries. The first step in both analyses is a proper construction of the claims. . . . The second step in the analyses requires a comparison of the properly construed claim to the prior art." *Medichem, S.A. v. Rolabo, S.L.*, 353 F.3d 928, 933 (Fed. Cir. 2003) (internal citations omitted).

"[A]nticipation of a claim under § 102 can be found only if the prior art reference discloses every element of the claim" *In re King*, 801 F.2d 1324, 1326 (Fed. Cir. 1986) (citing *Lindemann Maschinenfabrik GMBH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 1458 (Fed. Cir. 1984)). "[A]bsence from the reference of any claimed element negates anticipation." *Kloster Speedsteel AB v. Crucible, Inc.*, 793 F.2d 1565, 1571 (Fed. Cir. 1986).

Appellant has the burden on appeal to the Board to demonstrate error in the Examiner's position. *See In re Kahn*, 441 F.3d 977, 985-86 (Fed. Cir. 2006) ("On appeal to the Board, an applicant can overcome a rejection

1 [under § 103] by showing insufficient evidence of *prima facie* obviousness
2 or by rebutting the *prima facie* case with evidence of secondary indicia of
3 nonobviousness.”) (quoting *In re Rouffet*, 149 F.3d 1350, 1355 (Fed. Cir.
4 1998)).

5 6 V. ANALYSIS

7 *Common Feature In All Claims*

8
9 The only independent claim, claim 1, recites, *inter alia*, “*defining an*
10 *initial model of the subsurface formation based upon estimates of different*
11 *bed types and bed-type parameters in the formation, one of said bed-type*
12 *parameters being aspect ratio.*” Thus, the scope of each of the claims
13 includes a parameter that is an aspect ratio.

14 15 *The Board's Claim Construction*

16 “Our analysis begins with construing the claim limitations at issue.”
17 *Ex Parte Filatov*, No. 2006-1160, 2007 WL 1317144, at *2 (BPAI 2007).

18 Claims are given their broadest reasonable construction “in light of
19 the specification as it would be interpreted by one of ordinary skill in the
20 art.” *In re Am. Acad. of Sci. Tech. Ctr.*, 367 F.3d 1359, 1364 (Fed. Cir.
21 2004).

22 To determine whether Malinverno anticipates claim 1, we must first
23 determine the scope of the claim. The Examiner found that “[a]lthough the
24 claim recites aspect ratio it does not require it.” (Ans. 9.) We disagree.

25 We find that Appellant’s claim 1, shown *supra*, positively recites one
26 of the bed-type parameters being an “aspect ratio.” Thus, we find that the
27 Examiner cannot simply ignore this positively recited claim limitation and

1 therefore must show that the aforementioned claim limitation is disclosed in
2 the cited art.

3
4 *The Anticipation Rejection*

5 We now consider the Examiner's rejection of claims 1-6 under 35
6 U.S.C. § 102(a) as being anticipated by Malinverno.

7 Appellant contends that Malinverno "neither teaches nor suggests a
8 method involving classifying all beds into bed types, each bed type
9 characterized by bed-type parameters, with beds of finite lateral extent dealt
10 with by including bed aspect ratio among the bed-type parameters." (App.
11 Br. 4.) Appellant further contends that the "examiner is reading a limitation
12 out of the claim." (Reply Br. 2.)

13 The Examiner found that "[a]lthough the claim recites aspect ratio it
14 does not require it." (Ans. 9.) The Examiner further found that "[a]lthough
15 the Malinverno reference does not explicitly state the phrase 'aspect ratio',
16 based on the provided definition the layered earth discussed in the reference
17 will inherently have as a parameter an aspect ratio and this ratio will fall
18 somewhere in the range provided by the specification of the instant
19 application." (Ans. 9.) We disagree on both accounts.

20 As noted above, Appellant's claim 1 positively recites that one of said
21 bed-type parameters is an aspect ratio. The Specification defines "aspect
22 ratio" as the ratio of the bed thickness to the bed width (FF 1). The
23 Examiner has not shown and we do not readily find where Malinverno
24 shows a parameter that identifies a ratio of the bed thickness to the width.

25 While Malinverno discloses parameters that include seismic wave
26 velocities, porosities, permeabilities, fluid saturations, densities, fluid

1 pressures, temperatures, and reservoir thicknesses (FF 4-6), the Examiner
2 has not made the case that such parameters can reasonably be viewed as or
3 function as the claimed aspect ratio.

4 Regarding the Examiner's inherency conclusion, we note that "[i]t is
5 well settled that a prior art reference may anticipate when the claim
6 limitations not expressly found in that reference are nonetheless inherent in
7 it. Under the principles of inherency, if the prior art necessarily functions in
8 accordance with, or includes, the claimed limitations, it anticipates." *In re*
9 *Cruciferous Sprout Litig.*, 301 F.3d 1343, 1349 (Fed. Cir. 2002) (citations
10 and internal quotation marks omitted). "Inherency, however, may not be
11 established by probabilities or possibilities. The mere fact that a certain
12 thing may result from a given set of circumstances is not sufficient." *In re*
13 *Robertson*, 169 F.3d 743, 745 (Fed. Cir. 1999) (citations omitted).

14 Here, we find that the Examiner is relying on mere probabilities
15 because it is unclear that the missing descriptive matter is necessarily present
16 in the parameters disclosed by Malinverno, and that it would be recognized
17 by persons of ordinary skill in the art. Thus, we are not persuaded from the
18 disclosure in Malinverno that one of ordinary skill in the art reading
19 Malinverno would be clear that the parameters used include an aspect ratio
20 defined as the ratio of bed thickness to bed width.

21 Therefore, because Malinverno does not contain each and every
22 element of the invention of independent claim 1, we cannot sustain the
23 rejection of any of the claims under 35 U.S.C. § 102(a) on appeal.

24

Obviousness Rejection

The Examiner has not demonstrated on this record that Tabanou cures the deficiencies of Malinverno, noted *supra*.

Therefore, we also cannot sustain the rejection of any of the claims under 35 U.S.C. § 103(a) on appeal.

VI. NEW GROUND OF REJECTION UNDER 35 U.S.C. § 112(2)

Using our authority under 37 C.F.R. § 41.50(b), we reject claims 1-12 under 35 U.S.C. § 112, second paragraph, as being indefinite.

A. NEW ISSUE

(2) Whether claims 1-12 are indefinite under 35 U.S.C. § 112, second paragraph for failing to provide notice to the public regarding the metes and bound of the claim limitations, *viz.*, whether the “determining” claim element invokes 35 U.S.C. § 112, sixth paragraph?

B. PRINCIPLES OF LAW

(1)

35 U.S.C. § 112, Second Paragraph

(a)

The Statute – Operation and Purpose

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

35 U.S.C. § 112, second paragraph.

There are two separate requirements set forth in this paragraph:

1 (A) the claims must set forth the subject matter that applicants
2 regard as their invention; and

3 (B) the claims must particularly point out and distinctly
4 define the metes and bounds of the subject matter that will be
5 protected by the patent grant.

6 The first requirement is a subjective one because it is dependent on
7 what the applicants for a patent regard as their invention. The second
8 requirement is an objective one because it is not dependent on the views of
9 applicant or any particular individual, but is evaluated in the context of
10 whether the claim is definite — i.e., whether the scope of the claim is clear
11 to a hypothetical person possessing the ordinary level of skill in the pertinent
12 art. MPEP § 2171.

13

14 (2)

15 *Notice and Boundary Requirement*

The primary purpose of 35 U.S.C. § 112, second paragraph, is to provide notice to the public of the metes and bounds of the claimed invention. That the second paragraph of section 112 serves this purpose is well established.

The requirement stated in the second paragraph of section 112 existed long before the present statute came into force. Its purpose is *to provide* those who would endeavor, in future enterprise, to approach the area circumscribed by the claims of a patent, *with the adequate notice* demanded by due process of law, *so that they may more readily and accurately determine the boundaries* of protection involved and evaluate the possibility of infringement and dominance.

27 *In re Hammack*, 427 F.2d 1378, 1382 (CCPA 1970) (emphases added).

1 The Supreme Court addressed ambiguous language or vague
2 descriptions in an application for patent and its correlation to public notice in
3 *Merrill v. Yeomans*, 94 U.S. 568 (1876).

4 The developed and improved condition of the patent law, and of the
5 principles which govern the exclusive rights conferred by it, leave no
6 excuse for ambiguous language or vague descriptions. *The public*
7 *should not be deprived of rights supposed to belong to it, without*
8 *being clearly told what it is that limits these rights.* The genius of the
9 inventor, constantly making improvements in existing patents, -a
10 process which gives to the patent system its greatest value,- should not
11 be restrained by vague and indefinite descriptions of claims in existing
12 patents from the salutary and necessary right of improving on that
13 which has already been invented. It seems to us that nothing can be
14 more just and fair, both to the patentee and to the public, than that the
15 former should understand, and correctly describe, just what he has
16 invented, and for what he claims a patent.

17
18 *Id.* at 573-574 (emphasis added).

19 When faced with determining the metes and bounds of the property
20 the inventor owns, the Federal Circuit analogized patents to contracts or
21 deeds in *Markman v. Westview Instruments, Inc.*, 52 F.3d 967 (Fed. Cir.
22 1995) (en banc), *aff'd* 517 U.S. 370 (1996).

23 This illustrates how claim construction may sometimes require the
24 resolution of factual matters before a claim can be authoritatively
25 construed. The exercise is further informed by decisions interpreting
26 analogous instruments, for patents are legal documents like contracts
27 or deeds. *See Goodyear Dental Vulcanite Co. v. Davis*, 102 U.S. 222,
28 227, 26 L.Ed. 149 (1880) (patent as contract); *Motion Picture Patents*
29 *Co. v. Universal Film Mfg. Co.*, 243 U.S. 502, 510, 37 S.Ct. 416, 418,
30 61 L.Ed. 871 (1917) (patent as deed). The analogies are most apt. A
31 patent can be conceived of as a contract between the inventor and the
32 government. In return for full disclosure of the invention the
33 government gives a monopoly of sorts for a time. The rest of us may
34 be third party beneficiaries of this deal, partaking of the advancement
35 of knowledge the patent represents. *Or a patent may be thought of as*

1 *a form of deed which sets out the metes and bounds of the property the*
2 *inventor owns for the term and puts the world on notice to avoid*
3 *trespass or to enable one to purchase all or part of the property right*
4 *it represents.* The public holds a vested future interest in the property.
5 Accordingly, patents should be interpreted under the same rules as
6 govern interpretation of kindred documents. *Merrill v. Yeomans*, 94
7 U.S. 568, 571, 24 L.Ed. 235 (1877).

8
9 *Id.* at 997 (emphasis added).

10 More recently the Federal Circuit reiterated the notice and boundary
11 requirement of this section of the statute in *Halliburton Energy Services, Inc.*
12 *v. M-I LLC*, 514 F.3d 1244 (Fed. Cir. 2008).

13 35 U.S.C. § 112, ¶ 2 requires that the specification of a patent
14 “conclude with one or more claims particularly pointing out and
15 distinctly claiming the subject matter which the applicant regards as
16 his invention.” Because claims delineate the patentee's right to
17 exclude, *the patent statute requires that the scope of the claims be*
18 *sufficiently definite to inform the public of the bounds of the protected*
19 *invention*, i.e., what subject matter is covered by the exclusive rights
20 of the patent. Otherwise, competitors cannot avoid infringement,
21 defeating *the public notice function of patent claims.* *Athletic*
22 *Alternatives, Inc. v. Prince Mfg., Inc.*, 73 F.3d 1573, 1581 (Fed. Cir.
23 1996) (“[T]he primary purpose of the requirement is ‘to guard against
24 unreasonable advantages to the patentee and disadvantages to others
25 arising from uncertainty as to their [respective] rights.’ ”) (quoting
26 *Gen. Elec. Co. v. Wabash Appliance Corp.*, 304 U.S. 364, 369, 58
27 S.Ct. 899, 82 L.Ed. 1402, (1938)). The Supreme Court has stated that
28 “[t]he statutory requirement of particularity and distinctness in claims
29 is met only when [the claims] clearly distinguish what is claimed from
30 what went before in the art and clearly circumscribe what is
31 foreclosed from future enterprise.” *United Carbon Co. v. Binney &*
32 *Smith Co.*, 317 U.S. 228, 236, 63 S.Ct. 165, 87 L.Ed. 232 (1942).

33 *Id.* at 1249 (emphases added).

(3)

Before the USPTO

The Federal Circuit has held in post-issuance patent infringement cases that the definiteness requirement “does not compel absolute clarity” and “[o]nly claims ‘not amenable to construction’ or ‘insolubly ambiguous’ are indefinite” *Datamize, LLC v. Plumtree Software, Inc.*, 417 F.3d 1342, 1347 (Fed. Cir. 2005) (citations omitted). *See also StarScientific, Inc. v. R.J. Reynolds Tobacco Co.*, Appeal No. 07-1448, slip. op. at 22 (Fed. Cir. August 25, 2008) (“A claim term is not indefinite just because ‘it poses a difficult issue of claim construction,’” (quoting *Exxon Research & Eng’g Co. v. United States*, 265 F.3d 1371, 1375 (Fed. Cir. 2001))). The Federal Circuit has noted that such a high standard of ambiguity for finding indefiniteness is due to the statutory presumption of patent validity. *Exxon Research*, 265 F.3d at 1375 (“By finding claims indefinite only if reasonable efforts at claim construction prove futile, we accord respect to the statutory presumption of patent validity.”) *See also Modine Mfg. Co. v. U.S. Int’l Trade Comm’n*, 75 F.3d 1545, 1557 (Fed. Cir. 1996) (rejecting indefiniteness argument after construing claims; stating that “when claims are amenable to more than one construction, they should when reasonably possible be interpreted to preserve their validity.”) and *Athletic Alternatives, Inc. v. Prince Mfg., Inc.*, 73 F.3d 1573, 1581 (Fed. Cir. 1996) (court chose the narrower of two equally plausible claim constructions in order to avoid invalidating the claims). “Because a claim is presumed valid, a claim is indefinite only if the ‘claim is insolubly ambiguous, and no narrowing construction can properly be adopted.’” *Microprocessor Enhancement Corp. v. Texas Instruments Inc.*, 520 F.3d 1367, 1374 (Fed. Cir. 2008)

1 (quoting *Howell Int'l, Inc. v. Int'l Trade Comm'n*, 341 F.3d 1332, 1338-39
2 (Fed. Cir. 2003) (quoting *Exxon Research & Eng'g Co. v. United States*, 265
3 F.3d 1371, 1375 (Fed. Cir. 2001))).

4 This rule of reading issued patent claims narrowly in district court in
5 view of ambiguity does not apply to USPTO proceedings. In particular,
6 unlike in post-issuance claim construction, the USPTO gives pending claims
7 “their broadest reasonable interpretation consistent with the specification”
8 and “in light of the specification as it would be interpreted by one of
9 ordinary skill in the art.” *In re Am. Acad. of Sci. Tech. Ctr.*, 367 F.3d 1359,
10 1364 (Fed. Cir. 2004). This broader claim construction standard is justified
11 because, during prosecution, the applicant has the opportunity to amend the
12 claims, and the Federal Circuit has held that an applicant has the opportunity
13 and the obligation to define his or her invention precisely during proceedings
14 before the USPTO. *See In re Morris*, 127 F.3d 1048, 1056-57 (Fed. Cir.
15 1997) (35 U.S.C. 112, second paragraph places the burden of precise claim
16 drafting on the applicant); *In re Zletz*, 893 F.2d 319, 322 (Fed. Cir. 1989)
17 (manner of claim interpretation that is used by courts in litigation is not the
18 manner of claim interpretation that is applicable during prosecution of a
19 pending application before the USPTO).

20 As set forth in the MPEP:

21 USPTO personnel are to give claims their broadest reasonable
22 interpretation in light of the supporting disclosure. *In re Morris*, 127
23 F.3d 1048, 1054-55 (Fed. Cir. 1997). Limitations appearing in the
24 specification but not recited in the claim should not be read into the
25 claim. *E-Pass Techs., Inc. v. 3Com Corp.*, 343 F.3d 1364, 1369 (Fed.
26 Cir. 2003) (claims must be interpreted “in view of the specification”
27 without importing limitations from the specification into the claims
28 unnecessarily). *In re Prater*, 415 F.2d 1393, 1404-05 (CCPA 1969).
29 See also *In re Zletz*, 893 F.2d 319, 321-22 (Fed. Cir. 1989) (“During

1 patent examination the pending claims must be interpreted as broadly
2 as their terms reasonably allow.... The reason is simply that during
3 patent prosecution when claims can be amended, ambiguities should
4 be recognized, scope and breadth of language explored,
5 and clarification imposed.... An essential purpose of patent
6 examination is to fashion claims that are precise, clear, correct, and
7 unambiguous. Only in this way can uncertainties of claim scope be
8 removed, as much as possible, during the administrative process.”).

9 MPEP § 2106 (II) (Parallel citations omitted). As such, we employ a lower
10 threshold of ambiguity when reviewing a pending claim for indefiniteness
11 than those used by post-issuance reviewing courts. In particular, rather than
12 requiring that the claims are insolubly ambiguous, we hold that if a claim is
13 amenable to two or more equally reasonable claim constructions, the
14 USPTO is justified in requiring the applicant to more precisely define the
15 metes and bounds of the claimed invention by holding the claim
16 unpatentable under 35 U.S.C. § 112, second paragraph, as indefinite.³

17 MPEP 2143.03 (“If a claim is subject to more than one interpretation, at
18 least one of which would render the claim unpatentable over the prior art,
19 the examiner should reject the claim as indefinite under 35 U.S.C. 112,
20 second paragraph (see MPEP § 706.03(d)) and should reject the claim over
21 the prior art based on the interpretation of the claim that renders the prior art
22 applicable.”); see also MPEP 2173.06; *In re Wiggins*, 488 F.2d 538, 541-42

³ The USPTO’s justification is even more heightened when, as here, one or more of the equally plausible claim constructions leads to other rejections. Moreover, it would be antithetical to the purposes behind the broadest reasonable interpretation doctrine for the USPTO to simply deem the broadest of multiple reasonable interpretations as being “definite” for section 112, second paragraph purposes. Adopting such a practice would defeat the “essential purpose of patent examination” of removing uncertainties of claim scope during the administrative process. See *Zletz*, 893 F.2d at 322.

1 (CCPA 1973) (finding claim term “heterocyclic group” indefinite because
2 under the broadest reasonable interpretation, the Board correctly determined
3 that the claim term was amenable to both broader and narrower
4 constructions.); *see also Exxon Research and Eng’g Co. v. United States*,
5 265 F.3d 1371, 1380 (Fed. Cir. 2001) (citing *Wiggins* with approval and
6 explaining difference between examining indefiniteness of application
7 claims in patent prosecution compared to patent claims in district court).

8 The USPTO, as the sole agency vested with the authority to grant
9 exclusionary rights to inventors for patentable inventions, has a duty to
10 guard the public against patents of ambiguous and vague scope. Such
11 patents exact a cost on society due to their ambiguity that is not
12 commensurate with the benefit that the public gains from disclosure of the
13 invention. The USPTO is justified in using a lower threshold showing of
14 ambiguity to support a finding of indefiniteness under 35 U.S.C. § 112,
15 second paragraph, because the applicant has an opportunity and a duty to
16 amend the claims during prosecution to more clearly and precisely define the
17 metes and bounds of the claimed invention and to more clearly and precisely
18 put the public on notice of the scope of the patent.

19 As the Federal Circuit recently stated in *Halliburton Energy Servs.*:

20 When a claim limitation is defined in purely functional
21 terms, the task of determining whether that limitation is
22 sufficiently definite is a difficult one that is highly dependent
23 on context (e.g., the disclosure in the specification and the
24 knowledge of a person of ordinary skill in the relevant art area).
25 We note that the patent drafter is in the best position to resolve
26 the ambiguity in the patent claims, and *it is highly desirable*
27 *that patent examiners demand that applicants do so in*
28 *appropriate circumstances* so that the patent can be amended

1 during prosecution rather than attempting to resolve the
2 ambiguity in litigation.

3 *Halliburton Energy Servs.*, 514 F.3d at 1255 (emphasis added).

4 Also, the requirement that the applicant clearly and precisely set out
5 the metes and bounds of the claimed invention prior to completion of
6 examination of the patentability of the claims furthers the USPTO's duty to
7 issue valid patents. A fundamental principle of patent law is that the claims
8 measure the invention. *United Carbon Co. v. Binney & Smith Co.*, 317 U.S.
9 228, 232 (1942). The duty of the PTO is to issue valid claims upon whose
10 language the public can rely. *See Keystone Bridge Co. v. Phoenix Iron Co.*,
11 95 U.S. 274, 278 (1877) (“[In the Patent Office, applicant's] claim is, or is
12 supposed to be, examined, scrutinized, limited, and made to conform to what
13 he is entitled to.”); *Burns v. Meyer*, 100 U.S. 671, 672 (1880); *Graham v.*
14 *John Deere Co.*, 383 U.S. 1, 18 (1966) (“[T]he primary responsibility for
15 sifting out unpatentable material lies in the Patent Office. To await litigation
16 is--for all practical purposes--to debilitate the patent system.”).

17 We realize that our reviewing court has never before set forth a
18 different standard of review for indefiniteness under 35 U.S.C. § 112, second
19 paragraph, for pre-issuance pending claims and claims under reexamination
20 as compared with post-issuance patented claims. The Federal Circuit has,
21 however, noted that a different standard for indefiniteness may be
22 appropriate during prosecution of patent claims. *See Exxon Research*, 265
23 F.3d at 1384 (“If this case were before an examiner, the examiner might well
24 be justified in demanding that the applicant more clearly define U_L, and
25 thereby remove any degree of ambiguity. However, we are faced with an
26 issued patent that enjoys a presumption of validity.”) Accordingly, we adopt

1 this lower threshold standard of ambiguity for indefiniteness for claims
2 during prosecution in keeping with the USPTO's broadest reasonable
3 interpretation standard for claim construction.

4
5 C. § 112(2) ANALYSIS

6 We find it necessary to consider whether claim 1 is definite as
7 required by 35 U.S.C. § 112, second paragraph. As noted *supra*, this issue
8 turns on whether the scope of claim 1 is clear to a hypothetical person
9 possessing the ordinary level of skill in the pertinent art. Specifically, we
10 are concerned (1) that the “determining” element of claim 1 has more than
11 one equally plausible claim constructions of differing scope, and (2) whether
12 the hypothetical person has a sufficient basis upon which to select one
13 construction over others.

14 In this appeal, the plural claim constructions turn on whether or not
15 the applicant is invoking 35 U.S.C. § 112, sixth paragraph which is designed
16 to restrict pure functional claiming not only for structure claims, but process
17 claims as well. *See* 35 U.S.C. 112, paragraph 6 (“An element in a claim for
18 a combination may be expressed as a ... step for performing a specified
19 function without the recital of ... acts in support thereof, and such claim
20 shall be construed to cover the corresponding ... acts described in the
21 specification and equivalents thereof.”). *See* generally Section VII.B. To
22 date, our reviewing court has not yet seen a method claim that fell within
23 section 112, paragraph 6. Nevertheless, the Federal Circuit has recognized
24 that claims reciting steps for performing functions, without reciting any acts
25 for achieving those functions, will implicate section 112, paragraph 6. *See*
26 *O.I. Corp. v. Tekmar Co., Inc.*, 115 F.3d 1576, 1583 (Fed. Cir. 1997).

1 We begin by determining whether each of the elements of method
2 claim 1 is a recitation of an “act” or a “function”. See Section VII.B.(2)(e)
3 “Acts Versus Functions” *infra* for case law relevant to this determination.
4 Firstly, we conclude that the underlying function set forth in claim 1, and
5 what is accomplished by the claim as a whole, i.e., the end result, is to
6 determine a statistical distribution of the hydrocarbon pore volume of a
7 formation. (Spec. 1: para. [0002], first sentence).

8 Secondly, we conclude that the method elements of “defining an
9 initial model . . . based upon estimates of different bed types and bed-type
10 parameters” and “performing a Monte Carlo inversion to find the ranges of
11 bed-type parameters” recite “acts” which respectively describe how the
12 underlying functions of establishing a model and finding ranges of
13 parameters are performed.

14 Thirdly, for the final claim 1 method element of “determining a
15 statistical distribution . . .”, we find no acts within the element that limit the
16 scope of this functional claim element; we find that the term “determining”
17 does not itself include any limitation that one skilled in the art would
18 understand to connote a particular act; and we find that Appellant’s
19 Specification merely describes a particular end result of “determining a
20 statistical distribution for hydrocarbon pore volume.” (Spec. 1: para. [0002],
21 first sentence). Therefore, we conclude that the “determining a statistical
22 distribution” element recites a function which is a result to be accomplished
23 rather than an act to accomplish the underlying function.

24 Given the functional nature of the “determining a statistical
25 distribution” method element, Appellant is permitted to (A) include acts
26 within the “determining” element which would achieve the determining

1 function, or (B) invoke 35 U.S.C. § 112, paragraph 6. However, as noted
2 *supra*, we find no acts in the “determining” step, nor has Appellant given
3 notice to invoke § 112, 6th paragraph. Additionally, while Appellant may
4 file an application containing a claim element that (C) covers every
5 conceivable act for achieving a claimed result, Appellant is prohibited from
6 receiving a patent for such a claim element. *See O’Reilly v. Morse*, 56 U.S.
7 (15 How.) 62, 112, 14 L.Ed. 601 (1853); *Halliburton Oil Well Cementing*
8 *Co. v. Walker*, 329 U.S. 1, 7-8 (1946) (discussing “prohibited indefiniteness”
9 of pure functional claiming); and *In re Hyatt*, 708 F.2d 712, 714
10 (Fed. Cir. 1983).

11 In other words, we find that Appellant’s “determining” element of
12 claim 1 does not (A) include acts within the “determining” element which
13 would achieve the determining function, or (B) employ the “step for”
14 language that typically provides notice that a claim is invoking § 112,
15 paragraph 6. Nor has Appellant provided notice (in some form) that the
16 “determining” element of claim 1 does or does not (C) cover every
17 conceivable act for achieving the claimed result. It might be argued that, for
18 purposes of examination, the Office should presume that the “determining”
19 element of claim 1 does not cover every conceivable act. However, such a
20 presumption by the Office is not equivalent to notice from Appellant.

21 Were (A) acts present in the “determining” claim element, the
22 hypothetical person would be given notice and could reasonably conclude
23 that the element is not a step-plus-function element. Were (B) “step for”
24 language present in the “determining” element (or some other notice), the
25 hypothetical person would again be given notice and could reasonably
26 conclude that the element is a step-plus-function element. Were some notice

1 present that the element does or does not (C) cover every conceivable act for
2 achieving the claimed result, the hypothetical person would again be given
3 notice and could reasonably conclude that the element is or is not a step-
4 plus-function element. However, when the claim element and the record are
5 (as we find here) devoid of any notice, the hypothetical person can not
6 determine with any reasonable degree of certainty that the claim element is
7 or is not a step-plus-function element.

8 We note that although a non-step-plus-function interpretation of the
9 “determining” element of claim 1 is far broader than a step-plus-function
10 interpretation, we find nothing in Appellant’s Specification that precludes
11 the broader claim construction. Thus, either claim construction is
12 reasonable. We also note that Appellant has an opportunity and obligation
13 during prosecution before the USPTO to render the claim definite by
14 amendment or otherwise. For example, if an applicant before the USPTO
15 invokes 35 U.S.C. § 112, sixth paragraph, then the applicant has an
16 opportunity and obligation to specify, consistent with the notice requirement
17 of 35 U.S.C. § 112, second paragraph, that the claim limitation invokes
18 35 U.S.C. § 112, sixth paragraph. Thus, if Appellant wishes to have a claim
19 element treated under 35 U.S.C. § 112, sixth paragraph, applicants must
20 provide notice of the boundaries of the element of the claimed invention
21 by including the phrase “step for” in the element.

22 Because the “determining” element of claim 1 is amenable to two
23 different claim constructions of different scope, we conclude that claim 1,
24 and claims 2-12 which depend therefrom, are indefinite under
25 35 U.S.C. § 112, second paragraph.

D. OTHER § 112 CONCERNS

We note that were the determining step of claim 1 construed narrowly as a step-plus-function element, then Appellant's Specification fails to adequately set forth "acts" for performing the recited function, and thus the claim fails to particularly point out and distinctly claim the invention as required by 35 U.S.C. § 112, second paragraph. *See In re Donaldson*, 16 F.3d 1181, 1195 (Fed. Cir. 1994) (en banc).

Alternatively, if the determining step of claim 1 were construed broadly such that it does not invoke 35 U.S.C. § 112, sixth paragraph, then the step is a *purely functional* claim limitation which renders the claim unpatentable under 35 U.S.C. § 112, first paragraph, as not being enabled for the scope of the claims, as set forth *infra* in Section VII.

VII. NEW GROUND OF REJECTION UNDER 35 U.S.C. § 112(1)

Using our authority under 37 C.F.R. § 41.50(b), we reject claims 1-12 under 35 U.S.C. § 112, first paragraph, as not being enabled for the scope of the claims.

A. NEW ISSUE

(3) Whether purely functional language outside the application of 35 U.S.C. § 112, sixth paragraph is being used in claims 1-12 in an attempt to define a claim element?

B. PRINCIPLES OF LAW

(1)

*Introduction*⁴

Functional claiming is routinely permitted when the functional language further defines definite structure, material, or acts recited in the claim. *See e.g., Microprocessor Enhancement Corp. v. Texas Instruments, Inc.*, 520 F.3d 1367, 1375 (Fed. Cir. 2008) (holding functional claim language attached to a “pipeline stage” as clearly limited to a pipelined processor possessing the recited structure and capable of performing the recited functions and not indefinite). Our concern is not with such functional language which qualifies structure or acts. Rather, we look to the outermost boundary of functional claiming, i.e., “purely functional claiming.”

The sixth paragraph of 35 U.S.C. § 112 permits purely functional claiming only within specific limits (a claim element is construed to cover only disclosed structure, material, or acts and equivalents thereof), however, claims are being presented to the U.S. Patent and Trademark Office for review which reach beyond these limits. The discussion below addresses our concern that such claims avoid the limits of § 112, sixth paragraph, while at the same time enjoying the benefits (at least the appearance of coverage of any and all structure, material, or acts for achieving a claimed result) of broad purely functional claiming.

⁴ MPEP § 2181 further discusses the issues involved and relevant case law with respect to 35 U.S.C. § 112, sixth paragraph.

1 (2)

2 35 U.S.C. § 112, Sixth Paragraph

3 (a)

4 *The Statute – Operation and Purpose*

5 An element in a claim for a combination may be expressed as a
6 means or step for performing a specified function without the
7 recital of structure, material, or acts in support thereof, and such
8 claim shall be construed to cover the corresponding structure,
9 material, or acts described in the specification and equivalents
10 thereof.

11 35 U.S.C. § 112, sixth paragraph (2002).

12 The sixth paragraph of 35 U.S.C. § 112 has just as much application
13 during proceedings before the U.S. Patent and Trademark Office as it does
14 in district court cases for infringement matters. *In re Donaldson*, 16 F.3d
15 1189, 1194 (Fed. Cir. 1994) (en banc).

16 It is necessary to decide on an element-by-element basis whether
17 35 U.S.C. 112, sixth paragraph, applies. Not all terms in a means-plus-
18 function or step-plus-function clause are limited to what is disclosed in the
19 written description and equivalents thereof, since 35 U.S.C. 112, sixth
20 paragraph, applies only to the interpretation of the means or step that
21 performs the recited function. *See, e.g., IMS Technology, Inc. v. Haas*
22 *Automation, Inc.*, 206 F.3d 1422, 1432 (Fed. Cir. 2000) (the term “data
23 block” in the phrase “means to sequentially display data block inquiries”
24 was not the means that caused the sequential display, and its meaning was
25 not limited to the disclosed embodiment and equivalents thereof.).

26 “An element of a claim described as a means for performing a
27 function, if read literally, would encompass any means for performing the

1 function. But section 112 ¶ 6 operates to cut back on the types of means
2 which could literally satisfy the claim language.” *Johnston v. IVAC Corp.*,
3 885 F.2d 1574, 1580 (Fed. Cir. 1989) (emphasis and citations omitted).

4 “Properly understood section 112 ¶ 6 operates more like the reverse
5 doctrine of equivalents than the doctrine of equivalents because it restricts
6 the scope of the literal claim language.” *Id.*

7 “[T]he ‘broadest reasonable interpretation’ that an examiner may give
8 means-plus-function[or step-plus-function] language is that statutorily
9 mandated in paragraph six.” *In re Donaldson*, 16 F.3d at 1194-95.

10 “In this paragraph, structure and material go with means, acts go with
11 steps” *O.I. Corp. v. Tekmar Co., Inc.*, 115 F.3d 1576, 1583 (Fed. Cir. 1997).

12 What is true for means-plus-function claim elements is similarly true
13 with respect to steps-plus-function claim elements. *See e.g., O.I. Corp.*, 115
14 F.3d at 1583.

15 (b)

16 *Invoking 112, Sixth Paragraph*

17 (i)

18 “Means For”

19 When a claim uses the term “means” to describe a limitation, a
20 presumption arises that the inventor used the term to invoke § 112, ¶ 6.
21 *Altiris, Inc. v. Symantec Corp.*, 318 F.3d 1363, 1375 (Fed. Cir. 2003). “This
22 presumption can be rebutted when the claim, in addition to the functional
23 language, recites structure sufficient to perform the claimed function in its
24 entirety.” *Id.*

25 As the court set forth in *LG Electronics*:

1 " '[A] claim term that does not use 'means' will trigger the
2 rebuttable presumption that § 112 ¶ 6 does not apply.' "
3 *Lighting World, Inc. v. Birchwood Lighting, Inc.*, 382 F.3d
4 1354, 1358 (Fed.Cir.2004) (quoting *CCS Fitness, Inc. v.*
5 *Brunswick Corp.*, 288 F.3d 1359, 1369 (Fed.Cir.2002)). This
6 presumption can be rebutted "by showing that the claim
7 element recite[s] a function without reciting sufficient structure
8 for performing that function." *Watts v. XL Sys.*, 232 F.3d 877,
9 880 (Fed.Cir.2000) (citing *Rodime PLC v. Seagate Tech., Inc.*,
10 174 F.3d 1294, 1302 (Fed.Cir.1999)). However, the
11 presumption "is a strong one that is not readily overcome."
12 *Lighting World, Inc.*, 382 F.3d at 1358.

13 *LG Electronics, Inc. v. Bizcom Electronics, Inc.*, 453 F.3d 1364, 1372
14 (Fed. Cir. 2006).

15 Additionally, as the court set forth in *Mass. Inst. Of Tech.*:

16 The generic terms "mechanism," "means," "element," and
17 "device," typically do not connote sufficiently definite
18 structure. In *Personalized Media Commc'ns, LLC v. Int'l Trade*
19 *Com'n*, 161 F.3d 696 (Fed. Cir. 1998), we addressed the claim
20 term "digital detector." We contrasted the term "detector,"
21 which recited sufficient structure to avoid 112 ¶ 6, with
22 "generic structural term[s] such as 'means,' 'element,' or
23 'device,' " which do not. *Id.* at 704.

24 *Mass. Inst. Of Tech. v. Abacus Software*, 462 F.3d 1344, 1354 (Fed. Cir.
25 2006). Similarly, in *Lighting World, Inc. v. Birchwood Lighting, Inc.*, 382
26 F.3d 1354 (Fed. Cir. 2004), the court recognized that Section 112 ¶ 6 does
27 apply to "a term that is simply a nonce word or a verbal construct that is not
28 recognized as the name of structure and is simply a substitute for the term
29 'means for.'" *Id.* at 1360. However, as the court also set forth in *Mass. Inst.*
30 *Of Tech*, further claim language may provide the sufficient structure not
31 found in the generic term:

1 Claim language that further defines a generic term like
2 "mechanism" can sometimes add sufficient structure to avoid
3 112 ¶ 6. For example, in *Greenberg v. Ethicon Endo-Surgery,*
4 *Inc.*, 91 F.3d 1580 (Fed. Cir. 1996), which involved a
5 mechanical device, we held that 112 ¶ 6 did not apply to the
6 term "detent mechanism," because "the noun '[d]etent' denotes a
7 type of device with a generally understood meaning in the
8 mechanical arts, even though the definitions are expressed in
9 functional terms." *Id.* at 1583. The court recited several
10 dictionary definitions for "detent," including "a mechanism that
11 temporarily keeps one part in a certain position relative to that
12 of another, and can be released by applying force to one of the
13 parts." *Id.* (internal quotation marks and citations omitted).
14 These definitions connoted sufficient structure to avoid 112 ¶ 6.
15 We also concluded that "[t]he fact that a particular mechanism--
16 here 'detent mechanism'-- is defined in functional terms is not
17 sufficient to convert a claim element containing that term into a
18 'means for performing a specified function' within the meaning
19 of [112 ¶ 6]" because "[m]any devices take their names from
20 the functions they perform." *Id.* (footnote omitted).

21 *Mass. Inst. Of Tech.*, 462 F.3d at 1354.

22 (ii)

23 “Step For”

24 Claims employing the “step for” language signal the drafter's intent to
25 invoke § 112, paragraph 6. *Masco Corp. v. United States*, 303 F.3d 1316,
26 1327 (Fed. Cir. 2002).

27 For claims employing “step of” there is no presumption that these
28 limitations are in step-plus-function format. *Id.*

(c)

*By the language of 112(6) itself, failure to properly describe
the corresponding structure, material, or acts is
a failure to comply with the requirements of 112(2)*

Once a court concludes that a claim limitation is a means-plus-function limitation, two steps of claim construction remain: 1) the court must first identify the function of the limitation; and 2) the court must then look to the specification and identify the corresponding structure for that function. *Med. Instrumentation & Diagnostics Corp. v. Elekta AB*, 344 F.3d 1205, 1210 (Fed. Cir. 2003).

As set forth in *Default Credit*:

“[I]f one employs means-plus-function language in a claim, one must set forth in the specification an adequate disclosure showing what is meant by that language. If an applicant fails to set forth an adequate disclosure, the applicant has in effect failed to particularly point out and distinctly claim the invention as required by the second paragraph of section 112.” *In re Donaldson Co.*, 16 F.3d 1189, 1195 (Fed. Cir. 1994) (en banc). “The specification must be read as a whole to determine the structure capable of performing the claimed function.” *Budde v. Harley-Davidson, Inc.*, 250 F.3d 1369, 1379 (Fed. Cir. 2001). A structure disclosed in the specification qualifies as “corresponding” structure only if the specification or prosecution history clearly links or associates that structure to the function recited in the claim. *B. Braun Med. v. Abbott Labs.*, 124 F.3d 1419, 1424 (Fed. Cir. 1997). This duty to link or associate structure to function is the *quid pro quo* for the convenience of employing § 112, ¶ 6. *See O.I. Corp. v. Tekmar Co.*, 115 F.3d 1576, 1583 (Fed. Cir. 1997). “Fulfillment of the § 112, ¶ 6 trade-off cannot be satisfied when there is a total omission of structure.” *Atmel*, 198 F.3d at 1382. While corresponding structure need not include all things necessary to enable the claimed invention to work, it must include all structure that actually performs the recited function. *See*

1 *Cardiac Pacemakers, Inc. v. St. Jude Med., Inc.*, 296 F.3d 1106,
2 1119 (Fed. Cir. 2002).

3 *Default Proof Credit Card Sys. Inc. v. Home Depot U.S.A., Inc.*, 412 F.3d
4 1291, 1298 (Fed. Cir. 2005).

5 The “clear linkage or association” in the specification of the structure
6 to the function recited in the claim is determined based on the understanding
7 of an artisan of ordinary skill. *See Allvoice Computing PLC. v. Nuance*
8 *Communications, Inc.*, 504 F.3d 1236, 1242 (Fed. Cir. 2007).

9 “If there is no structure in the specification corresponding to the
10 means-plus-function limitation in the claims, the claim will be found invalid
11 as indefinite.” *Biomedino, LLC v. Waters Technologies Corp.*, 490 F.3d 946,
12 950 (Fed. Cir. 2007).

13 “While the specification must contain structure linked to claimed
14 means, this is not a high bar: ‘[a]ll one needs to do in order to obtain the
15 benefit of [§ 112, ¶ 6] is to recite some structure corresponding to the means
16 in the specification, as the statute states, so that one can readily ascertain
17 what the claim means and comply with the particularity requirement of
18 [§ 112,] ¶ 2.’ *Atmel*, 198 F.3d at 1382.” *Biomedino*, 490 F.3d at 950.

19 “[W]hile it is true that the patentee need not disclose details of
20 structures well known in the art, *see S3*, 259 F.3d at 1371, the specification
21 must nonetheless disclose some structure.” *Default Proof*, 412 F.3d at 1302.

22

23 (d)

24 *Rejections under 112(1) Are Not Precluded Even Though*
 25 *The Language of 112(6) Itself Only Implicates 112(2)*

26 The language of 35 U.S.C. § 112, sixth paragraph, itself only
27 implicates § 112, second paragraph. *In re Dossel*, 115 F.3d 942, 946

1 (Fed. Cir. 1997). The language does not implicate the requirements of
2 § 112, first paragraph. *Id.* Rather, some additional basis must be provided
3 for any rejection for failing to meet the other requirements of § 112. *Id.* at
4 947 (vacated and remanded for determination of whether the other
5 requirements imposed by § 112 have been met.)

6 The sixth paragraph of 35 U.S.C. § 112 does not impose any
7 requirements in addition to those imposed by 35 U.S.C. § 112, first
8 paragraph. *See In re Knowlton*, 481 F.2d 1357, 1366 (CCPA 1973).

9 Conversely, the invocation of 35 U.S.C. 112, sixth paragraph, does not
10 exempt an applicant from compliance with 35 U.S.C. 112, first and second
11 paragraphs. *See Donaldson*, 16 F.3d at 1195; *Knowlton*, 481 F.2d at 1366.
12 While 35 U.S.C. § 112, sixth paragraph, permits a particular form of claim
13 limitation, it cannot be read as creating an exception either to the
14 description, enablement or best mode requirements of the first paragraph or
15 the definiteness requirement of the second paragraph of 35 U.S.C. § 112. *In*
16 *re Knowlton*, 481 F.2d 1357 (CCPA 1973). *See, e.g., In re Ghiron*, 442 F.2d
17 985 (CCPA 1971) (undue experimentation); and *Sitrick v. Dreamworks*,
18 *LLC.*, 516 F.3d 993 (Fed. Cir. 2008) (For means plus function claiming, all
19 disclosed embodiments covered by the claim must be enabled).

20
21 (e)

22 *Acts Versus Functions*

23 “[A]n applicant can describe an element of his invention by the *result*
24 *accomplished* or the function served, rather than describing the item or
25 element to be used (e.g., “a means of connecting Part A to Part B,” rather

1 than “a two-penny nail”).” *Warner-Jenkinson Co., Inc. v. Hilton Davis*
2 *Chemical Co.*, 520 U.S. 17, 27 (1997) (emphasis added).

3 “We interpret the term ‘steps’ to refer to the generic description of
4 elements of a process, and the term “acts” to refer to the implementation of
5 such steps.” *O.I. Corp.*, 115 F.3d at 1582-83.

6 “In general terms, the ‘underlying function’ of a method claim
7 element corresponds to *what that element ultimately accomplishes* in
8 relationship to what the other elements of the claim and the claim as a whole
9 accomplish. “Acts,” on the other hand, correspond to *how the function is*
10 *accomplished.*” *Seal-Flex, Inc. v. Athletic Track and Court Construction*,
11 172 F.3d 836, 849-50 (Fed. Cir. 1999) (Rader, J., concurring) (emphases
12 added).

13 With respect to process claims, “[35 U.S.C. 112, sixth paragraph] is
14 implicated only when steps *plus* function *without* acts are present . . . If we
15 were to construe every process claim containing steps described by an ‘ing’
16 verb, such as passing, heating, reacting, transferring, etc., into a step-plus-
17 function limitation, we would be limiting process claims in a manner never
18 intended by Congress.” *O.I. Corp.*, 115 F.3d at 1583 (emphasis added).

19
20 (f)

21 *112(6) - What Constitutes Proper Support For*
22 *Means (Step) Plus Function Elements, Particularly*
23 *Data Processing Means (Step) plus Function Elements?*

24 If one skilled in the art would be able to identify the structure,
25 material or acts for performing the claimed function, then the requirements
26 of 35 U.S.C. 112, second paragraph, are satisfied. *See Atmel Corp. v.*
27 *Information Storage Devices, Inc.*, 198 F.3d 1374, 1381 (Fed. Cir. 1999); *In*

1 *re Dossel*, 115 F.3d at 946-47. However, a rejection under 35 U.S.C. 112,
2 second paragraph, is appropriate if there is no disclosure (or insufficient
3 disclosure) of structure, material or acts for performing the claimed function
4 (e.g., a bare statement that known techniques or methods can be used would
5 not be a sufficient disclosure). *See In re Donaldson*, 16 F.3d at 1195;
6 *Biomedino*, 490 F.3d at 952.

7 For a computer-implemented means-plus-function claim limitation
8 that invokes 35 U.S.C. 112, sixth paragraph, the corresponding structure is
9 required to be more than simply a general purpose computer or
10 microprocessor. *See Aristocrat Technologies, Inc. v. International Game*
11 *Technology*, 521 F.3d 1328, 1333 (Fed. Cir. 2008). The corresponding
12 structure for a computer-implemented function is the algorithm that
13 transforms the general purpose microprocessor to a special purpose
14 computer programmed to perform the disclosed algorithm that performs the
15 claimed function. *See Aristocrat*, 521 F.3d at 1338 and *WMS Gaming, Inc.*
16 *v. International Game Technology*, 184 F.3d 1339 (Fed. Cir. 1999).
17 Applicant may express the algorithm in any understandable terms including
18 as a mathematical formula, in prose, in a flow chart, or in any other manner
19 that provides sufficient structure. *See Finisar Corp. v. The DIRECTV Group*
20 *Inc.*, 523 F.3d 1323, 1340 (Fed. Cir. 2008). *See* MPEP § 2181 for examples
21 where the courts held that the corresponding structure is adequate for the
22 computer-implemented functions.⁵ A rejection under 35 U.S.C. § 112,
23 second paragraph, is appropriate if the written description of the
24 specification discloses no corresponding algorithm. *See Aristocrat*, 521 F.3d

⁵ *See e.g., Dossel*, 115 F.3d at 946-47; *Intel Corp. v. VIA Technologies, Inc.*, 319 F.3d 1357, 1366 (Fed. Cir. 2003).

1 at 1337-38. For example, merely referencing to a general purpose computer
2 with appropriate programming without providing any detailed explanation of
3 the appropriate programming (*see id.* at 1334), or simply reciting software
4 without providing some detail about the means to accomplish the function
5 (*see Finisar*, at 1340-41), would not be an adequate disclosure of the
6 corresponding structure to satisfy the requirements of 35 U.S.C. 112, second
7 paragraph, even when one skilled in the art is capable of writing the software
8 to convert a general purpose computer to a special purpose computer to
9 perform the claimed function.

10 (3)

11 *Halliburton (1946)*

12 The above-quoted 35 U.S.C. § 112, sixth paragraph, when enacted,
13 was a statutory response to the Supreme Court’s decision in *Halliburton Oil*
14 *Well Cementing Co. v. Walker*, 329 U.S. 1, 71 USPQ 175 (1946). In
15 *Halliburton*,⁶ the Supreme Court held invalid an apparatus claim on the
16 ground that it used a “means-plus-function” term which was purely
17 functional. Such a claim was improper because the means term with a stated
18 function merely described a particular end result, did not set forth any
19 specific structure, and would encompass any and all structures for achieving
20 that result, including those which were not what the applicant had invented.

21 In *Greenberg*, the Court of Appeals for the Federal Circuit stated:

22 As this court has observed, “[t]he record is clear on why
23 paragraph six was enacted.” *In re Donaldson Co.*, 16 F.3d
24 1189, 1194, 29 USPQ2d 1845, 1849 (Fed. Cir. 1994)(in banc).

⁶ *Halliburton* was the culmination of a long line of cases dealing with use of terms such as “means” and “mechanisms” in claims. *See, e.g.*, A.W. Deller, *Walker on Patents*, § 166, pp. 790-794 (Deller's Edition 1937).

1 In *Halliburton Oil Well Cementing Co. v. Walker*, 329 U.S. 1,
2 71 USPQ 175 (1946), the Supreme Court held invalid a claim
3 that was drafted in means-plus-function fashion. Congress
4 enacted paragraph six, originally paragraph three, to overrule
5 that holding. In place of the *Halliburton* rule, Congress adopted
6 a compromise solution, one that had support in the pre-
7 *Halliburton* case law: Congress permitted the use of purely
8 functional language in claims, but it limited the breadth of such
9 claim language by restricting its scope to the structure disclosed
10 in the specification and equivalents thereof. See *Valmont Indus.,*
11 *Inc. v. Reinke Mfg. Co.*, 983 F.2d 1039, 1041-42, 25 USPQ2d
12 1451, 1453-54 (Fed. Cir. 1993); *In re Fuetterer*, 319 F.2d 259,
13 264 n.11, 138 USPQ 217, 222 n.11 (CCPA 1963). (Emphasis
14 added.)

15 *Greenberg v. Ethicon Endo-Surgery Inc.*, 91 F.3d 1580, 1582 (Fed. Cir.
16 1996). As the Federal Circuit explained, the statutory solution represents
17 only a compromise.

18 The so-called “Halliburton rule” proscribed “conveniently functional
19 language at the exact point of novelty.” *Halliburton*, 329 U.S. at 8. More
20 generally, *Halliburton* proscribed purely functional claiming by prohibiting
21 a patentee from using “broad functional claims” to “obtain greater coverage
22 by failing to describe his invention than by describing it as the statute
23 commands.” *Id.* at 12-13. This general prohibition against the use of “purely
24 functional claim language” (and the more specific Halliburton rule) has not
25 been completely eliminated. Rather, “purely functional claim language” is
26 now permissible but only under the conditions of 35 U.S.C. § 112, sixth
27 paragraph, i.e., if its scope is limited to the corresponding structure, material,
28 or act disclosed in the specification and equivalents thereof.

29 In the absence of such limited construction, *Halliburton* is still
30 applicable to prohibit the use of “purely functional” claim language. Hence,

1 any claim that includes purely functional claim language and which is not
2 for whatever reason, subject to the limited construction under 35 U.S.C.
3 § 112, sixth paragraph, fails to meet the requirements of 35 U.S.C. § 112,
4 first paragraph, according to *Halliburton* and thus is unpatentable. As the
5 Supreme Court stated in analyzing Walker's broad, functional claim:

6 Under the circumstances the broadness, ambiguity, and
7 overhanging threat of the functional claim of Walker become
8 apparent. What he claimed in the court below and what he
9 claims here is that his patent bars anyone from using in an oil
10 well any device heretofore or hereafter invented which
11 combined with the Lehr and Wyatt machine performs the
12 function of clearly and distinctly catching and recording echoes
13 from tubing joints with regularity. Just how many different
14 devices there are of various kinds and characters which would
15 serve to emphasize these echoes, we do not know. The
16 Halliburton device, alleged to infringe, employs an electric
17 filter for this purpose. In this age of technological development
18 there may be many other devices beyond our present
19 information or indeed our imagination which will perform that
20 function and yet fit these claims. And unless frightened from
21 the course of experimentation by broad functional claims like
22 these, inventive genius may evolve many more devices to
23 accomplish the same purpose. [Citations omitted]. Yet if
24 Walker's blanket claims be valid, no device to clarify echo
25 waves, now known or hereafter invented, whether the device be
26 an actual equivalent of Walker's ingredient or not, could be
27 used in a combination such as this, during the life of Walker's
28 patent.

29
30 *Halliburton*, 329 U.S. at 12.

31
32 While the particular claim language involved in the Supreme Court's
33 *Halliburton* decision uses the word "means," the issue was claiming in a
34 purely functional manner, a practice condemned by pre-existing case law,
35 and not any particular problem associated uniquely with the word "means"

1 as distinguished from other purely functional words and phrases. With
2 regard to pre-existing case law around the time of the Supreme Court's
3 *Halliburton* decision, see *In re Fuetterer*, 319 F.2d 259, 263 (CCPA 1963),
4 wherein the Court of Customs and Patent Appeals explained:

5 In the *Fullam* case [*In re Fullam*, 161 F.2d 247 (CCPA 1947)],
6 this court stated that some claims were properly rejected as
7 “functional in claiming merely the desired result well known to
8 and sought after by workers skilled in the art.” Claims directed
9 merely to a “desired result” have long been considered
10 objectionable primarily because they cover any means which
11 anyone may ever discover of producing the result. See, e.g.,
12 *O'Reilly v. Morse*, 15 How. 62; *Heidbrink v. McKesson*, 290 F.
13 665.

14
15 (4)

16 *Federal Circuit*

17 With respect to patent infringement, numerous opinions from the
18 Court of Appeals for the Federal Circuit make abundantly clear that when
19 functional terminology is used either (1) 35 U.S.C. § 112, sixth paragraph,
20 applies to *limit* the purely functional phrase to corresponding structural
21 embodiments disclosed in the specification and equivalents thereof (see
22 *Ethicon, Inc. v. United States Surgical Corp.*, 135 F.3d 1456, 1463
23 (Fed. Cir. 1998) (“use of the word means gives rise to ‘a presumption that
24 the inventor used the term advisedly to invoke the statutory mandates for
25 means-plus-function clauses’”)), or (2) a particular claim phrase at issue is
26 not purely functional because its has *limiting* structure or acts (see, e.g.,
27 *Microprocessor Enhancement Corp. v. Texas Instruments Inc.*, 520 F.3d at
28 1375).

We know of no decisions of the Federal Circuit, outside these two *limiting* circumstances, that have permitted the patent holder to intentionally or unintentionally obtain patent protection using purely functional terminology. That is, in the context of patent infringement, we know of no area where a purely functional recitation, *not limited* by one of these two circumstances, survives.

(5)

Halliburton Scope of Enablement Issues Before the USPTO

Claim construction before the Federal Circuit has effectively precluded Halliburton type scope of enablement issues from arising in the infringement cases before the court. However, before the USPTO, there are situations where purely functional claiming, which is not further limited as discussed above, still raises concern. *See In re Zletz*, 893 F.2d 319, 322 (Fed. Cir. 1989) (manner of claim interpretation that is used by courts in litigation is not the manner of claim interpretation that is applicable during prosecution of a pending application before the PTO).

(a)

Purely Functional Claiming That Does Not Give Notice to Invoke 112(6)

When an applicant has not given notice to the public that his or her purely functional claim element is to be limited by the application of 35 U.S.C. § 112, sixth paragraph, a first USPTO concern is that discussed in Section VI *supra* with respect to 35 U.S.C. § 112, second paragraph. Additionally, a second USPTO concern is that such unlimited purely

1 functional claiming may reasonably be construed to encompass any and all
2 structures (or acts) for achieving that result, including those which are not
3 what the applicant invented. Thus, it is doubly critical that the USPTO be in
4 possession of such public notice when making a determination to grant a
5 patent.

6 That is, when the limitation encompasses any and all structures or acts
7 for achieving that result, including those which were not what the applicant
8 had invented, the disclosure fails to provide a scope of enablement
9 commensurate with the scope of the claim and the claim would violate the
10 prohibition of *Halliburton*.

11 We conclude that in claim construction before the USPTO the
12 Supreme Court's *Halliburton* case remains viable for claims having purely
13 functional claim language which is *unlimited* either by (1) the application of
14 35 U.S.C. § 112, sixth paragraph, or (2) the additional recitation of structure
15 or acts.

16
17 (b)

18 *When The File History Contains Notice That 112(6) Is Being Invoked*

19 When an applicant provides notice, as discussed *supra* in Section
20 VI.C, that the sixth paragraph of § 112 is being invoked to provide
21 corresponding structure, material, or acts described in the specification,
22 *Halliburton* is not relevant. However, there may be other scope of
23 enablement or § 112, first paragraph, issues. *See, e.g., Sitrick v.*
24 *Dreamworks, LLC.*, 516 F.3d 993 (For means plus function claiming, all
25 disclosed embodiments covered by the claim must be enabled).

(6)

Related Scope of Enablement Problems - Single Means Claims

“The long-recognized problem with a single means claim is that it covers every conceivable means for achieving the stated result, while the specification discloses at most only those means known to the inventor. *See O'Reilly v. Morse*, 56 U.S. (15 How.) 62, 112, 14 L.Ed. 601 (1853).” *In re Hyatt*, 708 F.2d 712, 714 (Fed. Cir. 1983).

As set forth in *Invitrogen Corp.*:

Section 112 requires that the patent specification enable "those skilled in the art to make and use the full scope of the claimed invention without 'undue experimentation' " in order to extract meaningful disclosure of the invention and, by this disclosure, advance the technical arts. *Koito Mfg.*, 381 F.3d at 1155 (quoting *Genentech, Inc. v. Novo Nordisk A/S*, 108 F.3d 1361, 1365 (Fed.Cir.1997) (citation omitted)). Because such a disclosure simultaneously puts those skilled in the art on notice of the enforceable boundary of the commercial patent right, the law further makes the enabling disclosure operational as a limitation on claim validity. "The scope of [patent] claims must be less than or equal to the scope of the enablement. The scope of enablement, in turn, is that which is disclosed in the specification plus the scope of what would be known to one of ordinary skill in the art without undue experimentation." *Nat'l Recovery*, 166 F.3d at 1196; *see also In re Goodman*, 11 F.3d 1046, 1050 (Fed.Cir.1993) ("[T]he specification must teach those of skill in the art 'how to make and how to use the invention as broadly as it is claimed.'"); *In re Fisher*, 57 C.C.P.A. 1099, 427 F.2d 833, 839 (1970) ("[T]he scope of the claims must bear a reasonable correlation to the scope of enablement provided by the specification to persons of ordinary skill in the art."). [footnote omitted].

Invitrogen Corp. v. Clontech Labs. Inc., 429 F.3d 1052, 1070-71 (Fed. Cir. 2005).

1 As we noted, single means claims are proscribed as discussed by the
2 court in *Hyatt*, 708 F.2d at 714. The court further stated:

3 Thus, the claim is properly rejected for what used to be
4 known as “undue breadth,” but has since been appreciated as
5 being, more accurately, based on the first paragraph of § 112.
6 [footnote omitted].

7 *Id.* However, combination claims in means-plus-function format are
8 construed in a manner to avoid the § 112, first paragraph problem:

9 The final paragraph of § 112 saves combination claims
10 drafted using means-plus-function format from this problem by
11 providing a construction of that format narrow enough to avoid
12 the problem of undue breadth as forbidden by the first
13 paragraph. But no provision saves a claim drafted in means-
14 plus-function format which is not drawn to a combination, i.e.,
15 a single means claim.

16 *Id.* at 715.

17 Prior to the enactment of § 112, sixth paragraph, the Court routinely
18 found purely functional claim elements, which include single means or
19 means-plus-function in combination claims, to be improper. *See General*
20 *Electric Co. v. Wabash Appliance Corporation*, 304 U.S. 364, 371 (1938)
21 (“[A] patentee may not broaden his product claims by describing the product
22 in terms of function.”), and *Halliburton Oil Well Cementing Co. v. Walker*,
23 329 U.S. 1 (1946):

24 The language of the claim thus describes this most crucial
25 element in the 'new' combination in terms of what it will do
26 rather than in terms of its own physical characteristics or its
27 arrangement in the new combination apparatus. We have held
28 that a claim with such a description of a product is invalid as a
29 violation of Rev.Stat. s 4888 [now covered by § 112]. [citations
30 omitted].

31 *Id.* at 9.

Nevertheless, the Federal Circuit’s section 112, first paragraph, concerns regarding the “undue breadth” of pure functional claiming apply with equal force to combination claims reciting one of the limitations in pure, functional form.

C. § 112(1) ANALYSIS

As discussed *supra* in Section VI, without notice of the boundaries of Applicant's invention we are left with plural reasonable claim constructions. Because claim 1 is amenable to both a broader and a narrower claim construction and our role at the USPTO is to give claims "their broadest reasonable interpretation consistent with the specification" and "in light of the specification as it would be interpreted by one of ordinary skill in the art," (*In re Am. Acad. of Sci. Tech. Ctr.*, 367 F.3d 1359, 1364 (Fed. Cir. 2004)), for purposes of this rejection we use the broader of the two reasonable claim constructions, *i.e.*, the non-step-plus-function interpretation of the "determining" element of claim 1. *See In re Cortright*, 165 F.3d 1353 (Fed. Cir. 1999) (applying broadest reasonable interpretation to evaluate enablement rejection).

We next consider whether claim 1 recites purely functional language outside the application of 35 U.S.C. § 112, sixth paragraph. As noted *supra*, this issue turns on whether purely functional language outside the application of 35 U.S.C. § 112, sixth paragraph, is being used in claim 1 in an attempt to define a claim element.

1 For the “determining” element as written we find nothing that limits
2 the scope of this purely functional claim element.⁷ Therefore, this
3 “determining” limitation encompasses any and all acts for achieving the
4 recited result, including those which were not what the Appellant had
5 invented.

6 Further, we find that the term “determining” does not itself include
7 any limitation that one skilled in the art would understand to connote a
8 particular act. We find that Appellant’s Specification merely describes a
9 particular end result of “*determining a statistical distribution for*
10 *hydrocarbon pore volume.*” The Appellant’s Specification fails to disclose
11 even one way of achieving this statistical distribution, let alone all of the
12 possible ways encompassed by the language of claim 1. This “determining”
13 claim element, which is directed to this desired result, is primarily
14 objectionable because it encompasses any and all acts for achieving the
15 result, including acts not invented by Appellant.

16 Thus, claim 1 does not recite any particular way of implementing the
17 “determining” claim element, nor does it require any machine or apparatus
18 to perform the function. In view of the foregoing discussion of the breadth
19 of claim 1 and the content of Appellant’s Specification, we find a *prima*
20 *facie* case that the Specification fails to enable those skilled in the art to
21 make and use the full scope of claimed invention, and therefore claim 1 fails
22 to satisfy 35 U.S.C. 112, paragraph 1. In other words, claim 1 suffers from
23 the same “undue breadth” problem observed by the Supreme Court in

⁷ In addition, Appellant is required to “indicate” argued step-plus-function elements in the Brief. *See* 37 C.F.R. § 41.37(c)(1)(v). We find no such indication with respect to claim 1.

1 *Halliburton*, and the Federal Circuit in *Hyatt*. Claims 2-12, which depend
2 from claim 1, likewise fail to further define the “determining” claim element
3 in a way that would recite any particular way of achieving the recited result.
4 As such, claims 1-12 are unpatentable under 35 U.S.C. § 112, first
5 paragraph, for lack of an enabling disclosure commensurate with the scope
6 of the claims.

7
8 VIII. 37 C.F.R. § 41.50(b)

9 37 C.F.R. § 41.50(b) provides that, “[a] new ground of rejection
10 pursuant to this paragraph shall not be considered final for judicial review.”

11 37 C.F.R. § 41.50(b) also provides that the Appellant, *WITHIN TWO*
12 *MONTHS FROM THE DATE OF THE DECISION*, must exercise one of the
13 following two options with respect to the new grounds of rejection to avoid
14 termination of proceedings:

15 (1) Reopen prosecution. Submit an appropriate amendment of the
16 claims so rejected or new evidence relating to the claims so rejected,
17 or both, and have the matter reconsidered by the examiner, in which
18 event the proceeding will be remanded to the examiner ...

19
20 (2) Request rehearing. Request that the proceeding be reheard under
21 37 C.F.R. § 41.52 by the Board upon the same record ...
22
23

24 IX. CONCLUSIONS

25 (1) We conclude that Appellant has established that the Examiner
26 erred in rejecting claims 1-12 under 35 U.S.C. §§ 102(a)/103(a).

27 (2) Since we have entered plural new grounds of rejection, our
28 decision is not a final agency action.

29 (3) Claims 1-12 are not patentable.

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X. DECISIONS

In view of the foregoing discussion, we reverse the Examiner's rejection of claims 1-12 under 35 U.S.C. §§ 102(a)/103(a).

We reject claims 1-12 under 35 U.S.C. § 112, first paragraph.

We reject claims 1-12 under 35 U.S.C. § 112, second paragraph.

REVERSED
37 C.F.R. § 41.50(b)

tdl

EXXON MOBIL UPSTREAM
RESEARCH COMPANY
P.O. BOX 2189
(CORP-URC-SW 359)
HOUSTON TX 77252-2189